Tega Cay Water Services, Inc.
Cause No. _____

BEFORE THE

PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA

PREPARED DIRECT TESTIMONY

OF

PAULINE M. AHERN, CRRA
PRINCIPAL
AUS CONSULTANTS

ON BEHALF OF

TEGA CAY WATER SERVICES, INC.

NOVEMBER 2012

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Introduction

Q. Please state your name, occupation and business address.

A. My name is Pauline M. Ahern. I am a Principal of AUS Consultants. My business address is 155 Gaither Drive, Suite A, Mt. Laurel, New Jersey 08054.

Q. Please summarize your professional experience and educational background.

A. I have offered expert testimony on behalf of investor-owned utilities before twenty-seven state regulatory commissions as well as one provincial regulatory commission in Canada on rate of return issues, including but not limited to common equity cost rate, fair rate of return, capital structure issues, credit quality issues and the like. I am a graduate of Clark University, Worcester, MA, where I received a Bachelor of Arts degree with honors in Economics. I have also received a Master of Business Administration with high honors and a concentration in finance from Rutgers University. The details of these appearances, my educational background, presentations I have given and articles I have co-authored are shown in Appendix A supplementing this testimony.

On behalf of the American Gas Association (A.G.A.), I calculate the A.G.A. Gas Index, which serves as the benchmark against which the performance of the American Gas Index Fund (AGIF) is measured monthly. The A.G.A. Gas Index and AGIF are a market capitalization weighted index and fund, respectively, comprised of the common stocks of the publicly traded corporate members of the A.G.A.

I am also the Publisher of AUS Utility Reports, responsible for supervising the production, publication, distribution and marketing of its various reports.

I am a member of the Society of Utility and Regulatory Financial Analysts (SURFA) where I serve on its Board of Directors, having served two terms as President, from 2006 – 2008 and 2008 – 2010. Previously, I held the position of Secretary/Treasurer from 2004 – 2006. In 1992, I was awarded the professional designation "Certified Rate of Return Analyst" (CRRA) by SURFA, which is based upon education, experience and the successful completion of a comprehensive written examination.

I am also an associate member of the National Association of Water Companies, serving on its Finance/Accounting/Taxation Committee; a member of the Energy Association of Pennsylvania, formerly the Pennsylvania Gas Association; and a member of the American Finance and Financial Management Associations.

Q. What is the purpose of your testimony?

A. The purpose is to provide testimony on behalf of Tega Cay Water Services, Inc. (Tega Cay or the Company) relative to the range of overall fair rate of return including the appropriate investor-required common equity cost rate which it should be afforded the opportunity to earn on the common equity financed portion of its jurisdictional rate base.

Q. What is your range of recommended common equity cost rate?

A. I recommend that the Public Service Commission of South Carolina (PSC SC or the Commission) authorize the Company the opportunity to earn a range of overall rate of return of 8.69% - 8.94%, based upon the consolidated capital structure of Utilities, Inc. (UI or the Parent) at December 31, 2011 developed by Company Witness Dylan W. D'Ascendis, CRRA, which consists of 50.25% long-term debt and 49.75% common equity at a long-term debt cost rate of 6.60%

and my range of recommended common equity cost rate of 10.80% - 11.30%. The range of overall rate of return is summarized in Table 1 below:

Table 1

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	50.25%	6.60%	3.32%
Common Equity	49.75	10.80% - 11.30	5.37 – 5.62
Total	100.00%		8.69%-8.94%

Q. Have you prepared schedules which support your range of recommended common equity cost rate?

A. Yes. It has been designated as Exhibit PMA-1 consisting of Schedules 1 through 13.

Summary

Q. Please summarize your range of range of recommended common equity cost rate.

A. My range of recommended common equity cost rate of 10.80% - 11.30% is summarized on Schedule 1, page 2. As a wholly-owned subsidiary of UI, Tega Cay's common stock is not publicly traded, hence a market-based common equity cost rate cannot be determined directly for Tega Cay. Therefore, in arriving at my range of recommended common equity cost rate of 10.80% - 11.30%, I have assessed the market-based common equity cost rates of companies of relatively similar, but not necessarily identical risk, i.e., a proxy group for insight into a recommended common equity cost rate applicable to Tega Cay. Using companies of relatively comparable similar risk as proxies is consistent with the principles of fair rate of return established in the *Hope*[1] and

[1] Federal Power Commission v. Hope Natural Gas Co., 320 U.S. 591 (1944).

Bluefield[2] cases, adding reliability to the informed expert judgment necessary to arrive at a recommended common equity cost rate. However, no proxy group can be selected to be identical in risk to Tega Cay. Therefore, the proxy group's results must be adjusted, if necessary, to reflect the unique relative financial and/or business risks of the Company, as will be discussed in detail subsequently.

Consistent with the Efficient Market Hypothesis (EMH), which will be discussed below, my recommendation results from the application of market-based cost of common equity models, the Discounted Cash Flow (DCF) approach, the Risk Premium Model (RPM) and the Capital Asset Pricing Model (CAPM) for the proxy group of nine water companies whose selection will be discussed subsequently. In addition, I also selected a group of domestic, non-price regulated companies comparable in total risk to the nine water companies, applying the DCF, RPM and CAPM to them as well as assessing projected returns on book common equity or partner's capital in accordance with the opportunity cost standards encapsulated in *Hope* and *Bluefield*.

The results derived from each are as follows:

[2] Bluefield Water Works Improvement Co. v. Public Serv. Comm'n, 262 U.S. 679 (1922).

Table 2

	Proxy Group of Nine Water Companies
Discounted Cash Flow Model	8.82%
Risk Premium Model	10.53%
Capital Asset Pricing Model	10.69%
Cost of Equity Models Applied to Comparable Risk, Non-Price Regulated Companies	13.00%
Indicated Common Equity Cost Rate Before Adjustment for Flotation Costs and Business Risks	10.70%
Business Risk Adjustment	0.35%
Indicated Common Equity Cost Rate	11.05%
Range of Recommended Common Equity Cost Rate	10.80% - 11.30%

After reviewing the cost rates based upon these models, I conclude that a common equity cost rate of 10.70% is indicated before any adjustment for business risk related to Tega Cay's greater business risk relative to the proxy group of nine water companies which will be discussed below. The indicated common equity cost rate based upon the nine water companies needs to be adjusted upward by 0.35% to reflect Tega Cay's greater business risk as noted above and discussed below. After adjustment, the business risk-adjusted common equity cost rate is 11.05%. Based upon this risk-adjusted common equity cost rate, my range of recommended common equity cost rate for Tega Cay is 10.80% - 11.30%.

General Principles

Q. What general principles have you considered in arriving at your range of recommended common equity cost rate of 10.80% - 11.30%?

A. In unregulated industries, the competition of the marketplace is the principal determinant of the price of products or services. For regulated public utilities, regulation must act as a substitute for marketplace competition. Assuring that the utility can fulfill its obligations to the public while providing safe and reliable service at all times requires a level of earnings sufficient to maintain the integrity of presently invested capital as well as permitting the attraction of needed new capital at a reasonable cost in competition with other firms of comparable risk, consistent with the fair rate of return standards established by the U.S. Supreme Court in the previously cited *Hope* and *Bluefield* cases. Consequently, marketplace data must be relied upon in assessing a common equity cost rate appropriate for ratemaking purposes. Therefore, my range of recommended common equity cost rate is based upon marketplace data for a proxy group of utilities as similar in risk as possible to Tega Cay, based upon selection criteria which will be discussed subsequently. Just as the use of the market data for the proxy group adds reliability to the informed expert judgment used in arriving at a range of recommended common equity cost rate, the use of multiple common equity cost rate models also adds reliability when arriving at a company-specific range of common equity cost rate.

Business Risk

Q. Please define business risk and explain why it is important to the determination of a fair rate of return.

A. Business risk is the riskiness of a company's common stock without the use of

debt and/or preferred capital. Examples of such general business risks to all utilities, i.e., water, electric and natural gas distribution, include the quality of management, the regulatory environment, customer mix and concentration of customers, service territory growth, capital intensity, size, and the like, which have a direct bearing on earnings.

Business risk is important to the determination of a fair rate of return because the greater the level of risk, the greater the rate of return investors demand, consistent with the basic financial principle of risk and return.

Q. What business risks face the water industry in general?

A. Water is essential to life and unlike electricity or natural gas, water is the only utility product which is intended for customers to ingest. Consequently, water quality is of paramount importance to the health and well-being of customers and is therefore subject to additional health and safety regulations. Also, unlike many electric and natural gas utilities, water utilities serve a production function in addition to the delivery functions served by electric and gas utilities.

Water utilities obtain supply from wells, aquifers, surface water reservoirs or streams and rivers. Throughout the years, well supplies and aquifers have been environmentally threatened, with historically minor purification treatment giving way to major well rehabilitation, treatment or replacement. Simultaneously, safe drinking water quality standards have tightened considerably, requiring multiple treatments. Supply availability is also limited by drought, water source overuse, runoff, threatened species/habitat protection and other operational, political and environmental factors. In the course of procuring water supplies and treating water so that it complies with Safe Drinking Water Act (SDWA) standards, water utilities have an ever-increasing

responsibility to be stewards of the environment from which supplies are drawn, in order to preserve and protect their essential natural resources of the United States.

Electric and natural gas companies, where transmission and distribution is separate from generation, generally do not produce the electricity or natural gas which they transmit and distribute. In contrast, water utilities are typically vertically engaged in the entire process of acquiring supply, production, treatment and distribution of water. Hence, water utilities require significant capital investment in not only sources of supply and production (wells and treatment facilities), but also in storage facilities as well as transmission and distribution systems, both to serve additional customers and to replace aging systems, creating a major risk facing the water and wastewater utility industry.

Value Line Investment Survey[3] (*Value Line*) observes the following about the water utility industry:

> Of specific concern is water utilities' extensive capital requirements and the financial constraints of those providing services. Many water infrastructures are in need of significant repairs and/or replacement. Although regulatory backing has been far better than in the past, the costs of doing business are likely to climb into the hundreds of millions of dollars over the next couple of years. Most companies operating in this space do not possess the cash to make the improvements, resulting in not only a great deal of consolidation, but also skepticism about the industry's future returns.
>
> Regardless of the more favorable regulatory landscape, water providers are still left holding the bill for most of the infrastructure improvements that need to be made. Indeed, most infrastructures are old and are in great need of repair or rebuilding. Unfortunately, the majority of those operating here lack the finances to fund the improvements on their own, and must raise

[3] *Value Line Investment Survey*, October 19, 2012.

> the capital via financing. And although external financing has become commonplace, the increased shares and or debt taken on in order to finance the upgrades are eating away at profits and diluting shareholder returns.

Consequently, because the water and wastewater industry is much more capital-intensive than the electric, combination electric and gas or natural gas utilities, the investment required to produce a dollar of revenue is greater. For example, as shown on page 1 of Schedule 2, it took $3.89 of net utility plant on average to produce $1.00 in operating revenues in 2011 for the water utility industry as a whole. In contrast, for the electric, combination electric and gas and natural gas utility industries, on average it took only $2.29, $1.88 and $1.29, respectively, to produce $1.00 in operating revenues in 2011. The greater capital intensity of water utilities is not a new phenomenon as water utilities have exhibited a consistently and significantly greater capital intensity relative to electric, combination electric and gas and natural gas utilities during the ten years ended 2011, as shown on page 2 of Schedule 2.

As financing needs have increased over the last decade, the competition for capital from traditional sources has increased, making the need to maintain financial integrity and the ability to attract needed new capital increasingly important. Because investor-owned water utilities typically do not receive federal funds for infrastructure replacement, the challenge to investor-owned water utilities is exacerbated and their access to financing is restricted, thus increasing risk.

The National Association of Regulatory Commissioners (NARUC) also highlighted the challenges facing the water and wastewater industry stemming from its capital intensity. NARUC's Board of Directors adopted the following

resolution in July 2005:[4]

> WHEREAS, To meet the challenges of the water and wastewater industry which may face a combined capital investment requirement nearing one trillion dollars over a 20-year period, the following policies and mechanisms were identified to help ensure sustainable practices in promoting needed capital investment and cost-effective rates: a) the use of prospectively relevant test years; b) the distribution system improvement charge; c) construction work in progress; d) pass-through adjustments; e) staff-assisted rate cases; f) consolidation to achieve economies of scale; g) acquisition adjustment policies to promote consolidation and elimination of non-viable systems; h) a streamlined rate case process; i) mediation and settlement procedures; j) defined timeframes for rate cases; k) integrated water resource management; l) a fair return on capital investment; *and* m) improved communications with ratepayers and stakeholders; *and*
>
> WHEREAS, Due to the massive capital investment required to meet current and future water quality and infrastructure requirements, adequately adjusting allowed equity returns to recognize industry risk in order to provide a fair return on invested capital was recognized as crucial...
>
> RESOLVED, That the National Association of Regulatory Utility Commissions (NARUC), convened in its July 2006 Summer Meetings in Austin, Texas, conceptually supports review and consideration of the innovative regulatory policies and practices identified herein as "best practices;" *and be it further*
>
> RESOLVED, That NARUC recommends that economic regulators consider and adopt as many as appropriate of the regulatory mechanisms identified herein as best practices...

The water utility industry also experiences lower relative depreciation rates. Lower depreciation rates, as one of the principal sources of internal cash flows for all utilities, mean that water utility depreciation as a source of internally-generated cash is far less than for electric, combination electric and gas or natural gas. Water utilities' assets have longer lives and, hence, longer capital recovery periods. As such, water utilities face greater risk due to inflation which results in a higher replacement cost per dollar of net plant than for other types

[4] "Resolution Supporting Consideration of Regulatory Policies Deemed as 'Best Practices'", Sponsored by the Committee on Water. Adopted by the NARUC Board of Directors, July 27, 2005.

of utilities. As shown on page 3 of Schedule 2, water utilities experienced an average depreciation rate of 3.0% for 2011. In contrast, in 2011, the electric, combination electric and gas and natural gas utilities experienced average depreciation rates of 3.5%, 3.5% and 3.4%, respectively.

As with capital intensity, the lower relative depreciation rates of water and wastewater utilities is not a new phenomenon. Low depreciation rates signify that the pressure on cash flows remains significantly greater for water utilities than for other types of utilities.

Not only is the water utility industry historically capital intensive, it is expected to incur significant capital expenditure needs over the next 20 years. Prior to the recent economic and capital market turmoil, Standard & Poor's (S&P) noted[5]:

> Standard & Poor's expects the already capital-intensive water utility industry to become even more so over the next several years. Due to the aging pipeline infrastructure and more stringent quality standards, the U.S. Environmental Protection Agency's [sic] (EPA) foresees a need for $277 billion to upgrade and maintain U.S. water utilities through 2022, with about $185 billion going toward infrastructure improvements. In addition, about $200 billion will be needed for wastewater applications, which suggests increased capital spending to be a long-term trend in this industry.
>
> In line with these trends, many companies have announced aggressive capital spending programs. Forecast capital spending primarily focuses on infrastructure replacements and growth initiatives. Over the past five years, capital spending has been equivalent to about three times its depreciation expense. However, companies are now forecasting spending to be at or above four times depreciation expense over the intermediate term. For companies in regulatory jurisdictions that provide timely cost recovery for capital expenditures, the increased spending is likely to have a minimal effect on financial metrics and ratings. However, companies in areas without these mechanisms,

[5] Standard & Poor's, Credit Outlook For U.S. Investor-Owned Water Utilities Should Remain Stable in 2008 (January 31, 2008) 2, 4.

earnings, and cash flow could be negatively affected by the increased spending levels, which over the longer term could harm a company's overall credit profile.

Specifically, the EPA states the following[6]:

> The survey found that the total nationwide infrastructure need is $334.8 billion for the 20-year period from January 2007 through December 2026. With $200.8 billion in needs over the next 20 years, transmission and distribution projects represent the largest category of need. This result is consistent with the fact that transmission and distribution mains account for most of the nation's water infrastructure. The other categories, in descending order of need are: treatment, storage, source and a miscellaneous category of needs called "other". The large magnitude of the national need reflects the challenges confronting water systems as they deal with an infrastructure network that has aged considerably since these systems were constructed, in many cases, 50 to 100 years ago.

The 2009 Report Card for America's Infrastructure[7] published by the American Society of Civil Engineers (ASCE) states:

> The nation's drinking-water systems face staggering public investment needs over the next 20 years. Although America spends billions on infrastructure each year, drinking water systems face an annual shortfall of at least $11 billion in funding needed to replace aging facilities that are near the end of their useful life and to comply with existing and future federal water regulations. The shortfall does not account for any growth in the demand for water over the next 20 years.[2] (footnote omitted)

Water utility capital expenditures as large as those projected by the EPA and ASCE will require significant financing. The three sources typically used for financing are debt, equity (common and preferred) and cash flow. All three are intricately linked to the opportunity to earn a sufficient rate of return as well as

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6 "Fact Sheet: "EPA's 2007 Drinking Water Infrastructure Needs Survey and Assessment", United States Environmental Protection Agency, Office of Water, February 2009, 1 (the most recently available).

7 2009 American Society of Civil Engineers, Report Card for America's Infrastructure 2009 (the most recently available).

the ability to achieve that return. Consistent with the *Hope* and *Bluefield* decisions discussed above, the return must be sufficient enough to maintain credit quality as well as enable the attraction of necessary new capital, be it debt or equity capital. If unable to raise debt or equity capital, the utility must turn to either retained earnings or free cash flow, both of which are directly linked to earning a sufficient rate of return. If either is inadequate, it will be nearly impossible for the utility to invest in needed infrastructure. Since all utilities typically experience negative free cash flows, it is clear that an insufficient rate of return can be financially devastating for utilities and for their customers, the ratepayers. Page 5 of Schedule 2 demonstrates that the free cash flows (funds from operations minus capital expenditures) of water utilities as a percent of total operating revenues has been consistently more negative than that of the electric, combination electric and gas and natural gas utilities for the ten years ending 2011, only showing slight improvement in 2011. Magnifying the impact of water utilities' negative free cash flow position is a continued inability to achieve what may already be an insufficient authorized rate of return on common equity, as will be discussed subsequently.

Consequently, as with the previously discussed capital intensity, depreciation rates and significant capital expenditures relative to net plant, the consistently and more significantly negative free cash flows relative to operating revenues of water utilities indicates greater investment risk for water utilities relative to electric, combination electric and gas and natural gas utilities.

In view of the foregoing, it is clear that the water utility industry's high degree of capital intensity, low depreciation rates and consistently low free cash flow, coupled with the need for substantial infrastructure capital spending,

requires regulatory support in the form of adequate and timely rate relief, including sufficient authorized returns on common equity as recognized by NARUC, so water utilities will be able to successfully meet the challenges they face.

Q. Are there other indications that the water utility industry exhibits more investment risk than the electric, combination electric and gas and natural gas utility industries?

A. Yes. Schedule 3 presents several such indications: total debt / earnings before interest, taxes, depreciation and amortization (EBITDA); funds from operations (FFO) / total debt; funds from operations / interest coverage; before-income tax / interest coverage; market capitalization; earned returns on common equity (ROEs) and earned v. authorized ROEs for each utility industry for the ten years ended 2011.

As noted below, S&P evaluates total debt as a percentage of EBITDA and FFO as a percentage of debt in the bond / credit rating process. Page 1 of Schedule 3 shows the increasing proportion of total debt to EBITDA for the water utilities and subsequent increasing and greater financial risk for water utilities, which began the most recent ten years below that of electric, combination electric and gas and natural gas utilities and is now higher. Notwithstanding the decline in 2010 and 2011, total debt / EBITDA is now approximately the same as that for the electric utilities, but higher than that for combination electric and gas and natural gas utilities. Page 2 shows that FFO / total debt has remained rather steady for water utilities over the decade ending 2011, rising slightly in 2011. However, FFO / total debt for combination electric and gas as well as natural gas utilities rose by the end of the ten years,

exceeding that of water utilities significantly in 2009, dropping back somewhat in 2010 and rising again in 2011. The consistently low level of FFO / total debt for the water utilities, further confirms the pressures upon water utility cash flows and the increased relative investment risk which the water utility industry faces.

Pages 3 and 4 of Schedule 3 confirm the pressures upon both cash flows and income faced by water utilities. Page 3 shows that FFO / interest coverage for the water, electric, combination electric and gas and natural gas utilities followed a similar pattern to FFO to total debt for the ten years ended 2011. FFO interest coverage remained relative consistent for water utilities, rising and falling between approximately 2.0 and 3.0 times during the period. A similar pattern was exhibited by electric utilities. Page 4 shows that before-income tax coverage interest coverage for water utilities also remained relatively stable, generally in line with that of the electric and combination electric and gas utility groups, but lower than that of the natural gas utility group for the entire ten years. In 2009, in all likelihood due to the "Great Recession" and the economy's continuing fragile recovery from it, before-income tax interest coverage for water, electric and combination electric and gas utilities all fell below 3.0 times, rising slightly in 2011, while natural gas utilities continue to enjoy a significantly higher before-income tax interest coverage. Once again, the consistently low level of interest coverage ratios for water utilities are further confirmation of the pressures upon cash flow which water utilities face, confirming greater investment risk for water utilities relative to electric, combination electric and gas and natural gas utilities.

The market capitalization of the four utility groups shown on page 5 clearly shows that the water utility group has consistently had the lowest market

capitalization, and therefore, the most risk based on size relative to the other utility groups as discussed below.

A final indication of the relative investment risk of water utilities compared with electric, combination electric and gas and natural gas utilities, are trends in earned ROEs. As shown on page 6 of Schedule 3, water utility earned returns have been generally lower than those of electric, combination electric and gas and natural gas utilities during the ten years ended 2011 except for 2002.

In view of all of the foregoing, it is clear that the investment risk of water utilities increased over the most recent ten years and that water utilities currently face greater investment risk relative to electric, combination electric and gas and natural gas utilities.

Q. Does Tega Cay face additional business risk?

A. Yes. Tega Cay faces additional unique business risk due to its small size relative to the proxy group. As discussed above, the greater the level of risk, the greater the rate of return demanded / required by investors, consistent with the basic financial precept of risk and return. Therefore an upward adjustment to the indicated common equity cost rate is necessary to reflect Tega Cay's smaller relative size.

Q. Please explain how Tega Cay's smaller size increases its business risk relative to the proxy groups.

A. As will be discussed below, Tega Cay's smaller size, $2.543 million in estimated total market capitalization relative to the average market capitalization of $1.444 billion for the nine water companies, shown on page 1 of Schedule 13, indicates greater relative business risk because all else equal, size has a bearing on risk.

Q. Please explain why size has a bearing on business risk.

A. It is conventional wisdom, supported by actual returns over time, that smaller companies tend to be more risky causing investors to expect greater returns as compensation for that risk. Smaller companies are simply less able to cope with significant events which affect sales, revenues and earnings. For example, smaller companies face more risk exposure to business cycles and economic conditions, both nationally and locally. Additionally, the loss of revenues from a few larger customers would have a greater effect on a small company than on a much larger company with a larger, more diverse, customer base. Moreover, smaller companies are generally less diverse in their operations and have less financial flexibility. In addition, extreme weather conditions, i.e., prolonged droughts or extremely wet weather, will have a greater affect upon a small operating water utility than upon the much larger, more geographically diverse holding companies.

Further evidence of the risk effects of size include the fact that investors demand greater returns to compensate for the lack of marketability and liquidity of the securities of smaller firms. That it is the use of funds invested and not the source of those funds which gives rise to the risk of any investment is a basic financial principle[8]. Therefore, the PSC should authorize a cost of common equity in this proceeding that reflects Tega Cay's relevant risk, including the impact of its small size. As noted above, Tega Cay is smaller than the average proxy group company based upon total capitalization.

In addition, Brigham[9] states:

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[8] Brealey, Richard A. and Myers, Stewart C., Principles of Corporate Finance (McGraw-Hill Book Company, 1996) 204-205, 229.

[9] Brigham, Eugene F., Fundamentals of Financial Management, Fifth Edition (The Dryden Press, 1989) 623.

> A number of researchers have observed that portfolios of small-firms have earned consistently higher average returns than those of large-firms stocks; this is called "small-firm effect." On the surface, it would seem to be advantageous to the small firms to provide average returns in a stock market that are higher than those of larger firms. In reality, it is bad news for the small firm; what *the small-firm effect means is that the capital market demands higher returns on stocks of small firms than on otherwise similar stocks of the large firms.* (italics added)

Consistent with the financial principle of risk and return discussed above, such increased risk due to small size must be taken into account in the allowed rate of return on common equity.

Financial Risk

Q. Please define financial risk and explain why it is important to the determination of a fair rate of return.

A. Financial risk is the additional risk created by the introduction of senior capital, i.e., debt and preferred stock, into the capital structure. The higher the proportion of senior capital in the capital structure, the higher the financial risk which must be factored into the common equity cost rate, consistent with the previously mentioned basic financial principle of risk and return, i.e., investors demand a higher common equity return as compensation for bearing higher investment risk.

In May 2009, S&P expanded its Business Risk / Financial Risk Matrix in an effort to augment its independence, strengthen the rating process and increase S&P's transparency to better serve its markets (see page 4 of Schedule 4). S&P initially published its electric, gas, and water utility ratings rankings in a framework consistent with the manner in which it presents its rating conclusions across all other corporate sectors in November 2007. S&P

then stated[10]:

> Incorporating utility ratings into a shared framework to communicate the fundamental credit analysis of a company furthers the goals of transparency and comparability in the ratings process.
>
> * * *
>
> The utilities rating methodology remains unchanged, and the use of the corporate risk matrix has not resulted in any changes to ratings or outlooks. The same five factors that we analyzed to produce a business risk score in the familiar 10-point scale are used in determining whether a utility possesses an "Excellent," "Strong," "Satisfactory," "Weak," or "Vulnerable" business risk profile.

In May 2009, S&P revised its Business Risk / Financial Risk Matrix with the new business risk/financial risk matrix shown in Table 1 on page 2 of Schedule 4 and financial risk indicative ratios for utilities shown in Table 2 on page 4. Notwithstanding the metrics published in Table 2, S&P stated:

> The rating matrix indicative outcomes are what we typically observe – but are not meant to be precise indications or guarantees of future rating opinions. Positive and negative nuances in our analysis may lead to a notch higher or lower than the outcomes indicated in the various cells of the matrix.

As shown on Schedule 8, page 5, the average S&P bond rating (issuer credit rating), business risk profile and financial risk profile of the nine water companies are split A+/A (A), Excellent and Significant.

Q. Nevertheless, can the combined business risks, i.e., investment risk of an enterprise, be proxied by bond and credit ratings?

A. Yes, similar bond ratings/issuer credit (bond/credit) ratings reflect and are representative of similar combined business and financial risks, i.e., total risk

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[10] Standard & Poor's – Ratings Direct – "U.S. Utilities Ratings Analysis Now Portrayed In The S&P Corporate Ratings Matrix" (November, 30, 2007) 2.

faced by bond investors. Although specific business or financial risks may differ between companies, the same bond/credit rating indicates that the combined risks are similar, albeit not necessarily equal, as the purpose of the bond/credit rating process is to assess credit quality or credit risk and not common equity risk. Risk distinctions within S&P's bond rating categories are recognized by a plus or minus, i.e., within the A category, an S&P rating can be at A+, A, or A-. Similarly, risk distinctions for Moody's ratings are distinguished by numerical rating gradations, i.e., within the A category, a Moody's rating can be A1, A2 and A3. For S&P, additional risk distinctions are reflected in the assignment of one of the six business risk profiles and six financial risk profiles, shown in Tables 1 and 2 on pages 2 and 4 of Schedule 4.

In summary, it is clear that S&P's bond/credit rating process encompasses a qualitative analysis of business and financial risks (see page 3 of Schedule 4). While not a means by which one can specifically quantify the differential in common equity risk between companies, bond/credit ratings provide a useful means with which to compare/differentiate investment risk between companies because they are the result of a thorough and comprehensive analysis of all diversifiable business risks, i.e., investment risk.

Tega Cay Water Services, Inc.

Q. Have you reviewed financial data for Tega Cay?

A. Tega Cay provides water service to approximately 1,790 customers and wastewater service to 1,690 customers in the City of Tega Cay in York County. Tega Cay is a wholly-owned subsidiary of UI, which is the sole source of Tega Cay's external capital. Thus, the Company's common stock is not publicly-traded.

Proxy Group

Q. Please explain how you chose the proxy group of nine water companies.

A. The basis of selection for the proxy group was to select those companies which meet the following criteria: 1) they are included in the Water Company Group of AUS Utility Reports (November 2012); 2) they have *Value Line*, Reuters, Zacks or Yahoo! Finance, consensus five-year earnings per share (EPS) growth rate projections; 3) they have a positive *Value Line* five-year dividends per share (DPS) growth rate projection: 4) they have a *Value Line* adjusted beta; 5) they have not cut or omitted their common dividends during the five years ending 2011 or through the time of the preparation of this testimony; 6) they have 70% or greater of 2011 total operating income derived from and 70% or greater of 2011 total assets devoted to regulated water operations; and 7) at the time of the preparation of this testimony, they had not publicly announced that they were involved in any major merger or acquisition activity, i.e., one publicly-traded utility merging with or acquiring another.

The following nine companies met these criteria: American States Water Co., American Water Works Co., Inc., Aqua America, Inc., Artesian Resources Corp., California Water Service Corp., Connecticut Water Service, Inc., Middlesex Water Company, SJW Corporation and York Water Company.

Q. Please describe Schedule 5.

A. Schedule 5 contains comparative capitalization and financial statistics for the nine water companies for the years 2007-2011.

During the five-year period ending 2011, the historically achieved average earnings rate on book common equity for the group averaged 7.69%. The average common equity ratio based upon permanent capital (excluding

short-term debt) was 49.32%, and the average dividend payout ratio was 66.14%.

Total debt as a percent of EBITDA for the years 2007-2011 ranged between 4.34 and 9.07 times, averaging 5.86 times, while funds from operations relative to total debt ranged from 15.04% to 18.82%, averaging 16.70%.

Common Equity Cost Rate Models

The Efficient Market Hypothesis (EMH)

Q. Please describe the conceptual basis of the EMH.

A. The EMH, which is the foundation of modern investment theory, was pioneered by Eugene F. Fama[11] in 1970. An efficient market is one in which security prices reflect all relevant information all the time, with the implication that prices adjust instantaneously to new information, thus reflecting the intrinsic fundamental economic value of a security.[12]

The generally-accepted "semistrong" form of the EMH asserts that all publicly available information is fully reflected in securities prices, i.e., that fundamental analysis cannot enable an investor to "out-perform the market" in the long-run as noted by Brealey and Myers[13]. The "semistrong" form of the EMH is generally held to be true because the use of insider information often enables investors to earn excessive returns by "outperforming the market" in the short-run. This means that all perceived risks and publicly-available information are taken into account by investors in the prices they pay for securities, such as

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[11] Fama, Eugene F., "Efficient Capital Markets: A Review of Theory and Empirical Work" (Journal of Finance, May 1970) 383-417.

[12] Morin, Roger A., New Regulatory Finance (Public Utility Reports, Inc., 2006) 279-281.

[13] Brealey, Richard A. and Myers, Stewart C., Principles of Corporate Finance First Edition, (McGraw-Hill, 1996) 329.

bond/credit ratings, discussions about companies by bond/credit rating agencies and investment analysts as well as the discussions of the various common equity cost rate methodologies (models) in the financial literature. In an attempt to emulate investor behavior, a limited number of common equity cost rate models, such as one or two, should not be relied upon exclusively in determining a cost rate of common equity and the results of multiple cost of common equity models should be taken into account. In addition, the academic literature provides substantial support for the need to rely upon multiple cost of common equity model in arriving at a recommended common equity cost rate.[14]

Q. Are the cost of common equity models you use market-based models, and hence based upon the EMH?

A. Yes. The DCF model is market-based in that market prices are utilized in developing the dividend yield component of the model. The RPM is market-based in that the bond ratings and expected bond yields used in the application of the RPM reflect the market's assessment of bond/credit risk. In addition, the use of betas to determine the equity risk premium also reflects the market's assessment of market/systematic risk as betas are derived from regression analyses of market prices. The CAPM is market-based for many of the same reasons that the RPM is market-based i.e., the use of expected bond (Treasury bond) yields and betas. The process of selecting the comparable risk non-utility companies is market-based in that it is based upon statistics which result from regression analyses of market prices and reflect the market's assessment of

[14] Morin 428-431.
Brigham, Eugene F. and Gapenski, Louis C., Financial Management – Theory and Practice Fourth Edition, (The Dryden Press, 1985) 256.
Brigham, Eugene F. and Daves, Phillip R., Intermediate Financial Management, (Thomson-Southwestern, 2007) 332-333.

total risk. Therefore, all the cost of common equity models I utilize are market-based models, and hence based upon the EMH.

Discounted Cash Flow Model (DCF)

Q. What is the theoretical basis of the DCF model?

A. The theory underlying the DCF model is that the present value of an expected future stream of net cash flows during the investment holding period can be determined by discounting those cash flows at the cost of capital, or the investors' capitalization rate. DCF theory indicates that an investor buys a stock for an expected total return rate which is derived from cash flows received in the form of dividends plus appreciation in market price (the expected growth rate). Mathematically, the dividend yield on market price plus a growth rate equals the capitalization rate, i.e., the total common equity return rate expected by investors.

Q. Which version of the DCF model do you use?

A. I utilize the single-stage constant growth DCF model because, in my experience, it is the most widely utilized version of the DCF used in public utility rate regulation. In my opinion, it is widely utilized because utilities are generally in the mature stage of their lifecycles and not transitioning from one growth stage to another. This is especially true for water utilities.

All companies, including utilities, go through typical life cycles in their development, initially progressing through a growth stage, moving onto a transition stage and finally assuming a steady-state or constant growth state. However, the U.S. public utility industry is a long-standing industry, dating back to approximately 1882. The standards of rate of return regulation of public utilities date back to the previously discussed principles of fair rate of return

established in the *Hope* and *Bluefield* decisions of 1944 and 1923, respectively. Hence, the public utility industry in the U.S. is a stable and mature industry characterized by the steady-state or constant-growth stage of a multi-stage DCF model. The regulated economics of the utility industry further reflect the features of this relative stability and demand maturity. Their returns on capital investment, i.e., rate base, are set through a ratemaking process and not determined in the competitive markets. This characteristic, taken together with the longevity of the public utility industry at large, all contribute to the stability and maturity of the industry, including the water utility industry.

Since there is no basis for applying multi-stage growth versions of the DCF model to determine the common equity cost rates of mature public utility companies, the constant growth model is most appropriate.

Q. Please describe the dividend yield you used in your application of the DCF model.

A. The unadjusted dividend yields are based upon a recent (October 31, 2012) indicated dividend divided by the average of closing market prices for the 60 days ending October 31, 2012 as shown in Column 1 on page 1 of Schedule 6.

Q. Please explain the adjusted dividend yield shown on page 1 of Schedule 6, Column 6.

A. Because dividends are paid quarterly, or periodically, as opposed to continuously (daily), an adjustment must be made to the dividend yield. This is often referred to as the discrete, or the Gordon Periodic, version of the DCF model.

DCF theory calls for the use of the full growth rate, or D_1, in calculating the dividend yield component of the model. However, since the various

companies in the proxy group increase their quarterly dividend at various times during the year, a reasonable assumption is to reflect one-half the annual dividend growth rate in the dividend yield component, or $D_{1/2}$. This is a conservative approach which does not overstate the dividend yield which should be representative of the next twelve-month period. Therefore, the actual average dividend yields in Column 1 on page 1 of Schedule 6 have been adjusted upward to reflect one-half the average projected growth rate shown in Column 6.

Q. Please explain the basis of the growth rates of the proxy group which you use in your application of the DCF model.

A. Schedule 7 shows that approximately 52% of the common shares of the nine water companies are held by individuals as opposed to institutional investors. Institutional investors tend to have more extensive informational resources than most individual investors. Individual investors, with more limited resources, are therefore likely to place great significance on the opinions expressed by financial information services, such as *Value Line*, Reuters, Zacks and Yahoo! Finance, which are easily accessible and/or available on the Internet and through public libraries. Investors realize that analysts have significant insight into the dynamics of the industries and individual companies they analyze, as well as company's abilities to effectively manage the effects of changing laws and regulations and ever changing economic and market conditions.

Over the long run, there can be no growth in DPS without growth in EPS. Security analysts' earnings expectations have a more significant, but not sole, influence on market prices than dividend expectations. Thus, the use of earnings growth rates in a DCF analysis provides a better matching between

investors' market price appreciation expectations and the growth rate component of the DCF. Earnings expectations have a significant influence on market prices and their appreciation or "growth" experienced by investors.[15] This should be evident even to relatively unsophisticated investors just by listening to financial news reports on radio, TV or reading the newspapers.

Q. Please summarize the DCF model results.

A. As shown on page 1 of Schedule 6, the median result of the application of the single-stage DCF model is 8.82% for the nine water companies. In arriving at a conclusion of a DCF-indicated common equity cost rate for the proxy group, I have relied upon the median of the results of the DCF, due to the wide range of DCF results as well as the continuing volatile capital market conditions in light of the continuing fragile economic recovery, and to not give undue weight to outliers on either the high or the low side. In my opinion, the median is a more accurate and reliable measure of central tendency, and provides recognition of all the DCF results.

The Risk Premium Model (RPM)

Q. Please describe the theoretical basis of the RPM.

A. The RPM is based upon the basic financial principle of risk and return, namely, that investors require greater returns for bearing greater risk. The RPM recognizes that common equity capital has greater investment risk than debt capital, as common equity shareholders are last in line in any claim on a company's assets and earnings, with debt holders being first in line. Therefore, investors require higher returns from common stocks than from investment in bonds, to compensate them for bearing the additional risk.

[15] Morin 298 - 303.

While the investors' required common equity return cannot be directly determined or observed, it is possible to directly observe bond returns and yields. According to RPM theory, one can assess a common equity risk premium over bonds, either historically or prospectively, and then use that premium to derive a cost rate of common equity.

In summary, according to RPM theory, the cost of common equity equals the expected cost rate for long-term debt capital plus a risk premium over that cost rate to compensate common shareholders for the added risk of being unsecured and last-in-line for any claim on the corporation's assets and earnings.

Q. Please explain how you derived your indicated cost of common equity based upon the RPM.

A. I averaged the results from the application of two risk premium methods. The first method is the Predictive Risk Premium Model™ (PRPM™), while the second method is a risk premium model using a total market approach.

Q. Please explain the PRPM™.

A. The PRPM™, which has been recently published in the *Journal of Regulatory Economics (JRE)*[16] was developed from the work of Robert F. Engle who shared the Nobel Prize in Economics in 2003 "for methods of analyzing economic time series with time-varying volatility (ARCH)[17]" with "ARCH" standing for autoregressive conditional heteroskedasticity. In other words, volatility changes over time and is related from one period to the next, especially

[16] "A New Approach for Estimating the Equity Risk Premium for Public Utilities", Pauline M. Ahern, Frank J. Hanley and Richard A. Michelfelder, Ph.D. The Journal of Regulatory Economics (December 2011), 40:261-278.

[17] www.nobelprize.org

in financial markets. Engle discovered that the volatility in prices and returns clusters over time. Therefore, high and low volatility periods can be used to predict equity risk premiums. The PRPM™ estimates the risk / return relationship directly, as the predicted equity risk premium is generated by the prediction of volatility, i.e., risk.

The inputs to the model are the historical returns on the common shares of each water company in the water utility group minus the historical monthly yield on long-term U.S. Treasury securities through September 2012. Using a generalized form of ARCH, known as GARCH, each water company's projected equity risk premium was determined using Eviews© statistical software. The forecasted 30-year U.S. Treasury Bond (Note) yield based upon the consensus forecast derived from the November 1, 2012 *Blue Chip Financial Forecasts (Blue Chip)*, or 3.15%, was averaged with the historical income return on long-term government bonds of 5.32% to derive a risk-free rate of 4.24%, as discussed below, which was then added to each company's PRPM™ derived equity risk premium to arrive at a PRPM™ derived common equity cost rate. Page 2 of Schedule 8 presents the results for each proxy company as well as the average and median results. As shown on page 2, the average PRPM™ indicated common equity cost rate is 13.90% and the median is 11.28% for the water utility group. Consistent with my reliance upon the median DCF results discussed above, I rely upon the median results of the PRPM™, 11.28%.

Q. Please explain the adjusted total market approach RPM.

A. The adjusted total market approach RPM adds a prospective public utility bond yield to an equity risk premium which is derived from a beta-adjusted total market equity risk premium and an equity risk premium based upon the S&P

Utilities Index.

Q. Please explain the basis of the expected bond yield of 4.64% applicable to the proxy group of nine water companies shown on page 3 of Schedule 8.

A. The first step in the adjusted total market approach RPM analysis is to determine the expected bond yield. Because both ratemaking and the cost of capital, including common equity cost rate, are prospective in nature, a prospective yield on similarly-rated long-term debt is essential. Hence, I rely upon a consensus forecast of about 50 economists of the expected yield on Aaa rated corporate bonds for the six calendar quarters ending with the first calendar quarter of 2014 as derived from the November 1, 2012 *Blue Chip* (shown on page 9 of Schedule 8). As shown on Line No. 1 of page 3 of Schedule 8, the average expected yield on Moody's Aaa rated corporate bonds is 3.83%. An adjustment of 0.52% is necessary to adjust that average Aaa corporate bond yield to be equivalent to a Moody's A2 rated public utility bond as shown on Line No. 2 and explained in Note 2 resulting in an expected bond yield applicable to a Moody's A rated public utility bond of 4.35% as shown on Line No. 3.

Since the nine water companies' average Moody's bond rating is A3, an adjustment of 0.29% is necessary to make the prospective bond yield applicable to an A3 public utility bond, as detailed in Note 3 on page 3 of Schedule 8. Therefore, the expected specific bond yield is 4.64% for the nine water companies as shown on Line No. 5.

Q. Please explain the method utilized to estimate the equity risk premium.

A. I evaluated the results of two different market equity risk premium studies based upon Ibbotson Associates' data, *Value Line's* forecasted total annual market

return in excess of the prospective yield on Moody's Aaa corporate bonds, as well as two different studies of the equity risk premium for public utilities with Moody's A rated bonds as detailed on pages 7, 8 and 10 of Schedule 8. As shown on Line No. 3, page 7, the mean equity risk premium is 5.13% applicable to the nine water companies. This estimate is the result of an average of a beta-derived equity risk premium as well as the average public utility equity risk premium relative to bonds rated A by Moody's based upon holding period returns.

Q. Please explain the basis of the beta-derived equity risk premium.

A. The basis of the beta-derived equity risk premium applicable to the proxy group is shown on page 8 of Schedule 8. The beta-determined equity risk premium should receive substantial weight because betas are derived from the market prices of common stocks over a recent five-year period. Beta is a meaningful measure of prospective relative risk to the market as a whole and a logical means by which to allocate a company's/proxy group's share of the market's total equity risk premium relative to corporate bond yields.

The total market equity risk premium utilized is 8.75%, based upon an average of the long-term arithmetic mean historical market equity risk premium, a predicted market equity risk premium based upon the PRPM™ and a forecasted market risk premium based upon *Value Line's* projected market appreciation and dividend yield. To derive the historical (expectational) market equity risk premium, I used the most recent Morningstar data on holding period returns for the large company common stocks from the Ibbotson® SBBI® – 2012 Valuation Yearbook – Market Results for Stocks, Bonds, Bills and Inflation – 1926-2011 (SBBI – 2012) and the average historical yield on Moody's Aaa and

Aa rated corporate bonds for the period 1926-2011. The use of holding period returns over a very long period of time is useful because it is consistent with the long-term investment horizon presumed by the DCF model.

Consequently, as explained in note 1 on page 8 of Schedule 8, the long-term arithmetic mean monthly total return rate on large company common stocks of 11.77% and the long-term arithmetic mean monthly yield on Moody's Aaa and Aa rated corporate bonds of 6.26% were used. As shown on Line No. 1, the resultant long-term historical equity risk premium on the market as a whole is 5.51%.

I used arithmetic mean monthly return rates and yields (income returns) because they are appropriate for cost of capital purposes as noted in the SBBI – 2012. Arithmetic mean return rates and yields are appropriate because ex-post (historical) total returns and equity risk premiums differ in size and direction over time, providing insight into the variance and standard deviation of returns. Because the arithmetic mean captures the prospect for variance in returns and equity risk premiums, it provides the valuable insight needed by investors in estimating future risk when making a current investment. Absent such valuable insight into the potential variance of returns, investors cannot meaningfully evaluate prospective risk. If investors alternatively relied upon the geometric mean of ex-post equity risk premiums, they would have no insight into the potential variance of future returns because the geometric mean relates the change over many periods to a constant rate of change, thereby obviating the year-to-year fluctuations, or variance, *critical to risk analysis.*

Only the arithmetic mean takes into account all of the returns / premiums, hence, providing meaningful insight into the variance and standard deviation of

those returns / premiums.

Q. Please explain the inputs to PRPM™ derived market equity risk premium.

A. The inputs to the model are the historical monthly returns on large company common stocks from minus the monthly yields on Aaa corporate bonds during the period from January 1928 through September 2012 (the latest available at the time of the preparation of this testimony). Using the previously discussed generalized form of ARCH, known as GARCH, the market's projected equity risk premium was determined using Eviews© statistical software. The resulting predicted market equity risk premium based upon the PRPM™ of 9.09% is shown on Line No. 2 on page 8 of Schedule 8.

Q. Please explain how you incorporated *Value Line's* forecasted total annual market return minus the prospective yield on Aaa rated corporate bonds in your development of an equity risk premium for your RPM analysis?

A. Once again, because both ratemaking and the cost of capital, including the cost rate of common equity are prospective, a prospective market equity risk premium is essential. The derivation of the forecasted or prospective market equity risk premium can be found in note 3 on page 8 of Schedule 8. Consistent with the development of the dividend yield component of my DCF analysis, it is derived from an average of the most recent thirteen weeks ending November 2, 2012 3-5 year median market price appreciation potential by *Value Line* plus an average of the median estimated dividend yield for the common stocks of the 1,700 firms covered in *Value Line*'s Standard Edition as explained in detail in Note 1 on page 2 of Schedule 9.

The average median expected price appreciation is 64% which translates to an 13.16% annual appreciation and, when added to the average (similarly

calculated) median dividend yield of 2.31% equates to a forecasted annual total return rate on the market as a whole of 15.47%. The forecasted total market equity risk premium of 11.64%, shown on Schedule 8, is derived by deducting the November 1, 2012 *Blue Chip* consensus estimate of about 50 economists of the expected yield on Moody's Aaa rated corporate bonds for the six calendar quarters ending with the first calendar quarter 2014 of 3.83% (11.64% = 15.47% - 3.83%).

In arriving at my conclusion of equity risk premium of 8.75% on Line No. 4 on page 8, I have given equal weight to the historical market equity risk premium of 5.51%, the PRPM™ based market equity risk premium of 9.09% and the forecasted market equity risk premium of 11.64% shown on Line Nos. 2 and 3, respectively (8.75% = (5.51% + 9.09% + 11.64%)/3).

Q. What is your conclusion of a beta-derived equity risk premium for use in your RPM analysis?

A. On page 1 of Schedule 9, the most current *Value Line* betas for the companies in the proxy group are shown. Applying the median beta of the proxy group of 0.65 (consistent with my reliance upon the median DCF results as previously discussed), to the market equity risk premium of 8.75% results in a beta adjusted equity risk premium of 5.69% for the proxy group of nine water companies.

Q. How did you derive the 4.57% equity risk premium based upon the S&P Utility Index and Moody's A rated public utility bonds?

A. First, I derived the long-term monthly arithmetic mean equity risk premium between the S&P Utility Index total returns of 10.56% and monthly A rated public utility bond yields of 6.75% from 1928-2011 to arrive at an equity risk

premium of 3.81% as shown on Line No. 3 on page 10 of Schedule 8. I then performed the PRPM™ using the same historical monthly equity risk premiums to arrive at the PRPM™ derived equity risk premium of 5.33% for the S&P Utility Index shown on Line No. 4, on page 10. The average of these equity risk premiums is 4.57%, shown on Line No. 5 (4.57% = (3.81% + 5.33%)/2).

Q. What is your conclusion of an equity risk premium for use in your adjusted total market approach RPM analysis?

A. The equity risk premium applicable to the proxy group of nine water companies is the average of the beta-derived premium, 5.69%, and that based upon the holding period returns of public utilities with A rated bonds, 4.57%, as summarized on Line No. 3 on Schedule 8, page 7, i.e., 5.13% (5.13% = (5.69% + 4.57%)/2).

Q. What is the indicated RPM common equity cost rate based on the adjusted total market approach?

A. It is 9.77% for the nine water companies as shown on Line No. 7 on Schedule 8, page 3.

Q. What are the results of your application of the PRPM™ and the total market approach RPM?

A. As shown on page 1 of Schedule 8, the average result from the PRPM™ and the adjusted total market approach RPM is 10.53% (10.53% = (11.28% + 9.77%)/2).

The Capital Asset Pricing Model (CAPM)

Q. Please explain the theoretical basis of the CAPM.

A. CAPM theory defines risk as the covariability of a security's returns with the market's returns as measured by beta (β). A beta less than 1.0 indicates lower

variability while a beta greater than 1.0 indicates greater variability than the market.

The CAPM assumes that all other risk, i.e., all non-market or unsystematic risk, can be eliminated through diversification. The risk that cannot be eliminated through diversification is called market, or systematic, risk. In addition, the CAPM presumes that investors require compensation only for these systematic risks which are the result of macroeconomic and other events that affect the returns on all assets. The model is applied by adding a risk-free rate of return to a market risk premium, which is adjusted proportionately to reflect the systematic risk of the individual security relative to the total market as measured by beta. The traditional CAPM model is expressed as:

$$R_s = R_f + \beta(R_m - R_f)$$

Where: R_s = Return rate on the common stock

R_f = Risk-free rate of return

R_m = Return rate on the market as a whole

β = Adjusted beta (volatility of the security relative to the market as a whole)

Numerous tests of the CAPM have measured the extent to which security returns and betas are related as predicted by the CAPM confirming its validity. The empirical CAPM (ECAPM) reflects the reality that while the results of these tests support the notion that beta is related to security returns, the empirical Security Market Line (SML) described by the CAPM formula is not as steeply sloped as the predicted SML.[18]

In view of theory and practical research, I have applied both the

[18] Morin 175.

traditional CAPM and the ECAPM to the companies in the proxy group and averaged the results.

Q. Please describe your selection of a risk-free rate of return.

A. As shown in column 3 on page 1 of Schedule 9, the risk-free rate adopted for both applications of the CAPM is 4.24%. The risk-free rate for my CAPM analysis is based upon the average of the consensus forecast of the reporting economists in the November 1, 2012 *Blue Chip* of the expected yields on 30-year U.S. Treasury bonds for the six quarters ending with the first calendar quarter of 2014 of 3.15% averaged with the historical arithmetic mean income return on long-term U.S. Treasury Bonds of 5.32% as shown in note 2, page 2 of Schedule 9 (4.24% = (3.15% + 5.32%)/2).

Q. Why have you averaged the prospective and historical yields on U.S. Treasury Securities?

A. Typically, I would rely exclusively upon the consensus forecast of the yield on 30-year U.S. Treasury Securities, as ratemaking and the cost of capital are both prospective in nature. However, these are not typical times for the U.S. Treasury securities market as the Federal Reserve Bank is artificially keeping interest rates low through mid-2015 amid concerns over the struggling U.S. economy. As a result, both 30-year U.S. Treasury Bond yields and the consensus forecasted yields are at historical lows.

Q. Why is the yield on long-term U.S. Treasury Bonds appropriate for use as the risk-free rate?

A. The yield on long-term U.S. Treasury T-Bonds is almost risk-free and its term is consistent with the long-term cost of capital to public utilities measured by the yields on A rated public utility bonds, the long-term investment horizon inherent

in utilities' common stocks, the long-term investment horizon presumed in the standard DCF model employed in regulatory ratemaking, and the long-term life of the jurisdictional rate base to which the allowed fair rate of return, i.e., cost of capital will be applied. In contrast, short-term U.S. Treasury yields are more volatile and largely a function of Federal Reserve monetary policy.

Q. Please explain the estimation of the expected equity risk premium for the market.

A. The basis of the market equity risk premium is explained in detail in Note 1 on page 2 of Schedule 9. It is derived from an average of the most recent thirteen weeks ending November 2, 2012 3-5 year median total market price appreciation projects from *Value Line*, resulting in a total annual return of 15.47%, as discussed above; the PRPM™ predicted market equity risk premium using monthly equity risk premiums for large company common stocks relative to long-term U.S. Treasury securities from January 1926 through September 2012; and, the arithmetic mean monthly equity risk premiums of large company common stocks relative to long-term U.S. Treasury bond income yields from SBBI-2012 from 1926-2011.

The *Value Line*-derived forecasted total market equity risk premium is derived by deducting the 4.24% average of the November 1, 2012 *Blue Chip* consensus estimate of the expected yield on U.S. Treasury Notes and the historical arithmetic mean income return on long-term government bonds discussed above from the *Value Line* projected total annual market return of 15.47%, resulting in a forecasted total market equity risk premium of 11.23%. The PRPM™ market equity risk premium is 10.19%; derived using the PRPM™, discussed above, relative to the yields on long-term U.S. Treasury securities

from January 1926 through September 2012 (the latest available at the time of the preparation of this testimony). The long-term income return on U.S. Government Securities of 5.32% was deducted from the SBBI-2012 monthly historical total market return of 11.77% resulting in an historical market equity risk premium of 6.45%.

These three market equity risk premiums, when averaged, result in an average total market equity risk premium of 9.29% (9.29% = (11.23% + 10.19% + 6.45%)/3).

Q. What are the results of your application of the traditional and empirical CAPM to the proxy group?

A. As shown on Schedule 9, page 1, the median traditional CAPM cost rate is 10.28% for the nine water companies and the median ECAPM cost rate is 11.09%. Consistent with my reliance upon the median DCF results discussed above, I rely upon the median results of the traditional CAPM and ECAPM for the proxy group. Thus, as shown on column 6 on page 1, the CAPM cost rate applicable to the proxy group of nine water companies is 10.69% based upon an average of the traditional CAPM and ECAPM results for the proxy group.

Cost of Common Equity Models Applied to Comparable, Domestic, Non-Price Regulated Companies

Q. Please describe the basis of applying cost of common equity models to comparable risk, non-price regulated companies.

A. Applying cost of common equity models to non-price regulated companies, comparable in total risk, is derived from the *"corresponding risk" standard* of the landmark cases of the U.S. Supreme Court, i.e., *Hope* and *Bluefield*, previously discussed. Therefore, it is consistent with the *Hope* doctrine that the return to

the equity investor should be commensurate with returns on investments in other firms having corresponding risks based upon the fundamental economic concept of opportunity cost which maintains that the true cost of an investment is equal to the cost of the best available alternative use of the funds to be invested. The opportunity cost principle is also consistent with one of the fundamental principles upon which regulation rests: that regulation is intended to act as a surrogate for competition and to provide a fair rate of return to investors.

The first step in determining such an opportunity cost of common equity based upon the non-price regulated companies comparable in total risk to the nine water companies is to choose an appropriate broad-based proxy group of non-price regulated firms comparable in total risk to the proxy group of price-regulated utilities which excludes utilities to avoid circularity.

As stated above, the selection criteria for the non-price regulated firms of comparable risk are based upon statistics derived from the market prices paid by investors. *Value Line* betas were used as a measure of systematic risk. The standard error of the regression was used as a measure of each firm's unsystematic or specific risk with the standard error of the regression reflecting the extent to which events specific to a company's operations affect its stock price. In essence, companies which have similar betas and standard errors of the regressions, have similar total investment risk. Using a Value Line proprietary database dated September 15, 2012, the application of these criteria results in a proxy group of non-price regulated firms comparable in total risk to the average utility in the proxy group of water companies as explained on page 4 of Schedule 10.

The first method of measuring such an opportunity cost is shown in Schedule 11. It measures the returns expected to be earned on the book common equity, net worth, or partner's capital of non-price regulated enterprises of comparable total risk as the nine water companies. The second method is to apply the DCF, RPM and CAPM to the same non-price regulated companies comparable in total risk to the nine water companies as shown on Schedule 12.

Expected Return On Book Equity For The Proxy Group of Domestic, Non-Price Regulated Companies

Q. How did you evaluate the expected return on book common equity, net worth, or partner's capital for the proxy group of domestic, non-price regulated companies that are comparable in total risk to the water utility proxy group?

A. Measuring the expected return on book common equity, net worth, or partner's capital provides a direct measure of return, since it translates into practice the competitive principle upon which regulation rests. Morin[19] notes:

> If the basis purpose of comparable earnings is to set a fair return rather than determine the true economic return, then the argument is academic. If regulators consider a fair return as one that equals the book rates of return earned by comparable-risk firms rather than one that is equal to the cost of capital of such firms, the Comparable Earnings test is relevant. This notion of fairness, rooted in the traditional legalistic interpretation of the *Hope* language, validates the Comparable Earnings test.

In my opinion, it is inappropriate to use the achieved returns of regulated utilities of similar risk because to do so would be circular, as achieved returns are a function of authorized ROEs, i.e., the regulatory process itself, and inconsistent with the principle of equality of risk with non-price regulated firms. As shown on

[19] Morin 394.

Schedule 11, the expected rate of return on book equity, net worth, or partner's capital was gathered from *Value Line's* Standard Edition (various issues). After applying a test of significance (Student's t-statistic) to determine whether any of the projected returns are significantly different from the mean at the 95% confidence level, the projected return of two companies has been excluded. After excluding these outliers, my conclusion of the expected return on book common equity net worth or partner's capital is 14.75%.

Common Equity Cost Rates For The Proxy Group Of Domestic, Non-Price Regulated Companies Based Upon the DCF, RPM and CAPM

Q. Did you calculate common equity cost rates using the DCF, RPM and CAPM for the proxy group of domestic, non-price regulated companies that are comparable in total risk to the utility proxy group?

A. Yes. Because the DCF, RPM and CAPM have been applied in an identical manner as described above relative to the market data of the nine water companies, I will not repeat the details of the rationale and application of each model shown on page 1 of Schedule 12. An exception is that, in the application of the RPM, I did not use public utility-specific equity risk premiums nor applied the PRPM™ to the individual companies.

Page 1 of Schedule 12 contains the derivation of the DCF cost rates. As shown, the median DCF cost rate for the proxy group of twenty-nine non-price regulated companies comparable in total risk to the proxy group of nine water companies, is 11.48%.

Pages 2 through 4 contain information relating to the 11.15% RPM cost rate for the proxy group of twenty-nine non-price regulated companies summarized on page 2. As shown on Line No. 1 of page 2 of Schedule 12, the

consensus prospective yield on Moody's Baa rated corporate bonds for the six quarters ending with the first quarter of 2014 from the November 1, 2012 *Blue Chip* is 5.02%. When the risk premium of 6.13% derived on page 4 is added to the prospective Baa rated corporate bond yield of 5.02%, the indicated RPM cost rate is 11.15%. The average market equity risk premium of 8.75% is based upon the average of the long-term arithmetic mean historical market equity risk premium, a PRPM™ derived equity risk premium, both based upon SBBI-2012, as well as projected market risk premium, as discussed above. The 8.75% average market equity risk premium, adjusted by the group's median beta of 0.70, results in an equity risk premium of 6.13% as shown on Line No. 6, page 4 of Schedule 12.

Page 5 contains the details of the application of the traditional CAPM and ECAPM to the twenty-nine non-price regulated companies comparable in total risk to the nine water companies. As shown, the median cost rates are 10.74% and 11.44%, respectively which, when averaged, results in an indicated CAPM cost rate of 11.09%.

Q. What are the cost rates, based upon the DCF, RPM and CAPM, related to the domestic, non-price regulated proxy group comparable in total risk to the utility proxy group?

A. The cost rates based upon application of the DCF, RPM and CAPM models to the non-utility group are 11.48%, 11.15% and 11.09%, respectively, averaging 11.24% as summarized on page 1 of Schedule 10.

Q. What is your conclusion of the cost rate of common equity based upon the proxy group of twenty-nine non-price regulated companies comparable in total risk to the nine water companies?

A. As shown on page 1 of Schedule 10, my conclusion of the projected return on book equity, partner's capital or net worth of the comparable group is 14.75% and my conclusion is 11.24% for the results of the DCF, RPM and CAPM applied to the comparable group. Based upon these results, I conclude a cost of common equity of 13.00% for the non-price regulated companies as summarized on page 1 of Schedule 10.

Conclusion of Common Equity Cost Rate

Q. What is your range of recommended common equity cost rate?

A. It is 10.80% - 11.30% based upon the indicated common equity cost rate of 10.70% resulting from the application of multiple cost of common equity models to the nine water companies as well as a proxy group of non-price regulated companies comparable in total risk to the nine water companies, adjusted for Tega Cay's greater business risks.

The results of the cost of common equity models applied to the nine water companies are shown on Schedule 1 , page 2 and summarized below:

Table 3

	Proxy Group of Nine Water Companies
Discounted Cash Flow Model	8.82%
Risk Premium Model	10.53%
Capital Asset Pricing Model	10.69%
Cost of Equity Models Applied to Comparable Risk, Non-Price Regulated Companies	13.00%
Indicated Common Equity Cost Rate Before Adjustment for Flotation Costs and Business Risks	10.70%
Business Risk Adjustment	0.35%
Indicated Common Equity Cost Rate	11.05%
Range of Recommended Common Equity Cost Rate	10.80% - 11.30%

Based upon these common equity cost rate results, I conclude that a common equity cost rate of 10.70% is indicated for the nine water companies before the business risk adjustment discussed above, shown on Line No. 7 on page 2 of Schedule 1.

Business Risk Adjustment

Q. Is there a way to quantify a business risk adjustment due to Tega Cay's small size relative to the proxy group?

A. Yes. As discussed above, the Company has greater business risk than the average company in the proxy group because of its smaller size relative to the group, measured by either book capitalization or the market capitalization of common equity (estimated market capitalization for Tega Cay, whose common

stock is not traded).

Table 4

	Market Capitalization(1) ($ Millions)	Times Greater than the Company
Tega Cay	$2.543	
Proxy Group of Nine Water Companies	1,444.244	567.9x

(1) From page 1 of Schedule 13.

Because the Company's common stock is not publicly traded, I have assumed that if it were, the common shares would be selling at the same market-to-book ratio as the average market-to-book ratio for the proxy group, 196.2%, on October 31, 2012 as shown on page 2 of Schedule 13. Since my recommended common equity cost rate is based upon the market data of the proxy group, it is reasonable to use the market-to-book ratios of the proxy group to estimate Tega Cay's market capitalization. Hence, the Company's market capitalization is estimated at $2.543 million based upon the average market-to-book ratio of the proxy group. In contrast, the market capitalization of the average water company was $1.444 billion on October 31, 2012, or 567.9 times the size of Tega Cay's estimated market capitalization.

Therefore, it is necessary to upwardly adjust the common equity cost rate of 10.70% based upon the nine water companies to reflect Tega Cay's greater risk due to its smaller relative size. The determination is based upon the size premiums for decile portfolios of New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and NASDAQ listed companies for the 1926-2011 period and related data from SBBI-2012. The average size premium for the 6th

decile which the proxy group falls has been compared with the average size premium for the 10th decile in which the market capitalization of Tega Cay would fall if its stock were traded and sold at the October 31, 2012 average market/book ratio of 196.2% experienced by the proxy group. As shown on page 1, the size premium spread between the 10th decile and the 6th decile is 4.35%.

In view of the foregoing, an upward adjustment of 0.35% to reflect Tega Cay's greater relative business risk due to its smaller size is warranted. A business risk adjustment of 0.35%, when applied to the 10.70% indicated common equity cost rate based upon the nine water companies before adjustment, results in a business risk-adjusted common equity cost rate of 11.05%[20]. Based upon this risk-adjusted common equity cost rate, my range of recommended common equity cost rate based upon current capital market conditions is 10.80% - 11.30%.

A range of common equity cost rates of 10.80% - 11.30% when applied to the common equity ratio of 49.75%, results in a range of overall rate of returns of 8.69% - 8.94%. In my opinion, this overall rate of return is both reasonable and conservative, providing Tega Cay with sufficient earnings to enable it to attract necessary new capital.

Q. Does that conclude your direct testimony?

A. Yes.

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[20] 11.05% = 10.70% + 0.35%.

APPENDIX A

PROFESSIONAL QUALIFICATIONS

OF

PAULINE M. AHERN, CRRA
PRINCIPAL

AUS CONSULTANTS

PROFESSIONAL QUALIFICATIONS
OF
PAULINE M. AHERN, CRRA
PRINCIPAL
AUS CONSULTANTS

PROFESSIONAL EXPERIENCE

1994-Present

In 1996, I became a Principal of AUS Consultants, continuing to offer testimony as an expert witness on the subjects of fair rate of return, cost of capital and related issues before state public utility commissions. I provide assistance and support to clients throughout the entire ratemaking litigation process. In addition, I supervise the financial analyst and administrative staff in the preparation of fair rate of return and cost of capital exhibits which are filed along with expert testimony before various state and federal public utility regulatory bodies. The team also assists in the preparation of interrogatory responses, as well as rebuttal exhibits.

As the Publisher of AUS Utility Reports (formerly C. A. Turner Utility Reports), I am responsible for the production, publishing, and distribution of the reports. AUS Utility Reports provides financial data and related ratios for about 120 public utilities, i.e., electric, combination gas and electric, natural gas distribution, natural gas transmission, telephone, and water utilities, on a monthly, quarterly and annual basis. Among the subscribers of AUS Utility Reports are utilities, many state regulatory commissions, federal agencies, individuals, brokerage firms, attorneys, as well as public and academic libraries. The publication has continuously provided financial statistics on the utility industry since 1930.

As the Publisher of AUS Utility Reports, I also supervise the production, publishing, and distribution of the AGA Rate Service publications under license from the American Gas Association. I am also responsible for maintaining and calculating the performance of the AGA Index, a market capitalization weighted index of the common stocks of the approximately 70 corporate members of the AGA, which serves as the benchmark for the AGA Gas Utility Index Fund.

As an Assistant Vice President from 1994 - 1996, I prepared fair rate of return and cost of capital exhibits which were filed along with expert testimony before various state and federal public utility regulatory bodies. These supporting exhibits include the determination of an appropriate ratemaking capital structure and the development of embedded cost rates of senior capital. The exhibits also support the determination of a recommended return on common equity through the use of various market models, such as, but not limited to, Discounted Cash Flow analysis, Capital Asset Pricing Model and Risk Premium Methodology, as well as an assessment of the risk characteristics of the client utility. I also assisted in the preparation of responses to any interrogatories received regarding such testimonies filed on behalf of client utilities. Following the filing of fair rate of return testimonies, I assisted in the evaluation of opposition testimony in order to prepare interrogatory questions, areas of cross-examination, and rebuttal testimony. I also evaluated and assisted in the preparation of briefs and exceptions following the hearing process. I also submitted testimony before state public utility commissions regarding appropriate capital structure ratios and fixed capital cost rates.

1990-1994

As a Senior Financial Analyst, I supervised two analysts and assisted in the preparation of fair rate of return and cost of capital exhibits which are filed along with expert testimony before various state and federal public utility regulatory bodies. The team also assisted in the preparation of interrogatory responses.

I evaluated the final orders and decisions of various commissions to determine whether further actions were warranted and to gain insight which assisted in the preparation of future rate of return studies.

I assisted in the preparation of an article authored by Frank J. Hanley and A. Gerald Harris entitled "Does Diversification Increase the Cost of Equity Capital?" published in the July 15, 1991 issue of Public Utilities Fortnightly.

In 1992, I was awarded the professional designation "Certified Rate of Return Analyst" (CRRA) by the National Society of Rate of Return Analysts (now the Society of Utility and Regulatory Financial Analysts (SURFA)). This designation is based upon education, experience and the successful completion of a comprehensive examination.

As Administrator of Financial Analysis for AUS Utility Reports, which then reported financial data for over 200 utility companies with approximately 1,000 subscribers, I oversaw the preparation of this monthly publication, as well as the accompanying annual publication, Financial Statistics - Public Utilities.

1988-1990

As a Financial Analyst, I assisted in the preparation of fair rate of return studies including capital structure determination, development of senior capital cost rates, as well as the determination of an appropriate rate of return on equity. I also assisted in the preparation of interrogatory responses, interrogatory questions of the opposition, areas of cross-examination and rebuttal testimony. I also assisted in the preparation of the annual publication C. A. Turner Utility Reports - Financial Statistics - Public Utilities.

1973-1975

As a Research Assistant in the Research Department of the Regional Economics Division of the Federal Reserve Bank of Boston, I was involved in the development and maintenance of econometric models to simulate regional economic conditions in New England in order to study the effects of, among other things, the energy crisis of the early 1970's and property tax revaluations on the economy of New England. I was also involved in the statistical analysis and preparation of articles for the New England Economic Review. Also, I was Assistant Editor of New England Business Indicators.

1972

As a Research Assistant in the Office of the Assistant Secretary for International Affairs, U.S. Treasury Department, Washington, D.C., I developed and maintained econometric models which simulated the economy of the United States in order to study the results of various alternate foreign trade policies so that national trade policy could be formulated and recommended.

Clients Served

I have offered expert testimony before the following commissions:

Arkansas
Arizona
British Columbia
California
Canada
Connecticut
Delaware
Florida
Hawaii
Idaho
Illinois
Indiana
Iowa
Kentucky
Louisiana
Maine
Maryland
Michigan
Missouri
Nevada
New Jersey
New York
North Carolina
Ohio
Pennsylvania
Rhode Island
South Carolina
Virginia
Washington

I have sponsored testimony on fair rate of return and related issues for:

Alpena Power Company
Apple Canyon Utility Company
Applied Wastewater Management, Inc.
Aqua Illinois, Inc.
Aqua New Jersey, Inc.
Aqua North Carolina, Inc.
Aqua Ohio, Inc.
Aqua Virginia, Inc.
Aquarion Water Company
Arizona Water Company
Artesian Water Company
Bermuda Water Company
The Atlantic City Sewerage Company
Audubon Water Company
The Borough of Hanover, PA
Carolina Pines Utilities, Inc.
Carolina Water Service, Inc. of NC
Carolina Water Service, Inc. of SC
The Columbia Water Company
The Connecticut Water Company
Consumers Illinois Water Company
Consumers Maine Water Company
Consumers New Jersey Water Company
City of DuBois, Pennsylvania
Elizabethtown Water Company
Emporium Water Company
GTE Hawaiian Telephone Inc.
Greenridge Utilities, Inc.
Illinois American Water Company
Iowa American Water Company
Water Services Corp. of Kentucky
Lake Wildwood Utilities Corp.
Land'Or Utility Company
Long Island American Water Company
Long Neck Water Company
Louisiana Water Service, Inc.
Massanutten Public Service Company
Middlesex Water Company
Missouri-American Water Company
Mt. Holly Water Company
Nero Utility Services, Inc.
New Jersey Utilities Association
The Newtown Artesian Water Company
NRG Energy Center Pittsburgh LLC
NRG Energy Center Harrisburg LLC
Ohio-American Water Company
Penn Estates Utilities
Pinelands Water Company
Pinelands Waste Water Company
Pittsburgh Thermal
San Gabriel Valley Water Company
San Jose Water Company
Southland Utilities, Inc.
Spring Creek Utilities, Inc.
Sussex Shores Water Company
Tega Cay Water Services, Inc.
Total Environmental Services, Inc. –
Treasure Lake Water & Sewer Divisions
Thames Water Americas
Tidewater Utilities, Inc.
Transylvania Utilities, Inc.
Trigen – Philadelphia Energy Corporation
Twin Lakes Utilities, Inc.
United Utility Companies
United Water Arkansas, Inc.
United Water Arlington Hills Sewerage, Inc.
United Water Connecticut, Inc.
United Water Delaware, Inc.
United Water Great Gorge Inc. / United Water
Vernon Transmission, Inc.
United Water Idaho, Inc.
United Water Indiana, Inc.
United Water New Jersey, Inc.
United Water New Rochelle, Inc.
United Water New York, Inc.
United Water Owego / Nichols, Inc.
United Water Pennsylvania, Inc.
United Water Rhode Island, Inc.
United Water South County, Inc.
United Water Toms River, Inc.
United Water Vernon Sewage Inc.
United Water Virginia, Inc.
United Water Westchester, Inc.
United Water West Lafayette, Inc.
United Water West Milford, Inc.
Utilities, Inc.
Utilities Inc. of Central Nevada
Utilities, Inc. of Florida
Utilities, Inc. of Louisiana
Utilities, Inc. of Nevada
Utilities, Inc. of Pennsylvania
Utilities, Inc. - Westgate
Utilities Services of South Carolina
Utility Center, Inc.
Valley Energy, Inc.
Wellsboro Electric Company
Western Utilities, Inc.

I have sponsored testimony on generic/uniform methodologies for determining the return on common equity for:

Aquarion Water Company
The Connecticut Water Company
Corix Multi-Utility Services, Inc.
United Water Connecticut, Inc.
Utilities, Inc.

I have sponsored testimony on the rate of return and capital structure effects of merger and acquisition issues for:

California-American Water Company
New Jersey-American Water Company

I have sponsored testimony on capital structure and senior capital cost rates for the following clients:

Alpena Power Company
Arkansas-Western Gas Company
Associated Natural Gas Company
PG Energy Inc.
United Water Delaware, Inc.
Washington Natural Gas Company

I have sponsored testimony on Distribution System Improvement Charges (DSIC):

Arizona Water Company

I have assisted in the preparation of rate of return studies on behalf of the following clients:

Algonquin Gas Transmission Company
Anadarko Petroleum Corporation
Arizona Water Company
Arkansas-Louisiana Gas Company
Arkansas Western Gas Company
Artesian Water Company
Associated Natural Gas Company
Atlantic City Electric Company
Bridgeport-Hydraulic Company
Cambridge Electric Light Company
Carolina Power & Light Company
Citizens Gas and Coke Utility
City of Vernon, CA
Columbia Gas/Gulf Transmission Cos.
Commonwealth Electric Company
Commonwealth Telephone Company
Conestoga Telephone & Telegraph Co.
Connecticut Natural Gas Corporation
Consolidated Gas Transmission Company
Consumers Power Company
CWS Systems, Inc.
Delmarva Power & Light Company
East Honolulu Community Services, Inc.
Equitable Gas Company
Equitrans, Inc.
Florida Power & Light Company
Gary Hobart Water Company
Gasco, Inc.
GTE Arkansas, Inc.
GTE California, Inc.
GTE Florida, Inc.
GTE Hawaiian Telephone
GTE North, Inc.
GTE Northwest, Inc.
GTE Southwest, Inc.
Great Lakes Gas Transmission L.P.
Hawaiian Electric Company
Hawaiian Electric Light Company
IES Utilities Inc.
Illinois Power Company
Interstate Power Company
Interstate Power & Light Co.
Iowa Electric Light and Power Company
Iowa Southern Utilities Company
Kentucky-West Virginia Gas Company
Lockhart Power Company
Middlesex Water Company
Milwaukee Metropolitan Sewer District
Mountaineer Gas Company
National Fuel Gas Distribution Corp.
National Fuel Gas Supply Corp.
Newco Waste Systems of NJ, Inc.
New Jersey Natural Gas Company
New Jersey-American Water Company
New York-American Water Company
North Carolina Natural Gas Corp.
Northumbrian Water Company
Ohio-American Water Company
Oklahoma Natural Gas Company
Orange and Rockland Utilities
Paiute Pipeline Company
PECO Energy Company
Penn Estates Utilities, Inc.
Penn-York Energy Corporation
Pennsylvania-American Water Co.
PG Energy Inc.
Philadelphia Electric Company
Providence Gas Company
South Carolina Pipeline Company
Southwest Gas Corporation
Stamford Water Company
Tesoro Alaska Petroleum Company
Tesoro Refining & Marketing Co.
United Telephone of New Jersey
United Utility Companies
United Water Arkansas, Inc.
United Water Delaware, Inc.
United Water Idaho, Inc.
United Water Indiana, Inc.
United Water New Jersey, Inc.
United Water New York, Inc.
United Water Pennsylvania, Inc.
United Water Virginia, Inc.
United Water West Lafayette, Inc.

(Rate of Return Study Clients Continued)

Utilities, Inc. of Pennsylvania
Utilities, Inc. - Westgate
Vista-United Telecommunications Corp.
Washington Gas Light Company
Washington Natural Gas Company
Washington Water Power Corporation
Waste Management of New Jersey – Transfer Station A
Wellsboro Electric Company
Western Reserve Telephone Company
Western Utilities, Inc.
Wisconsin Power and Light Company

EDUCATION:

1973 – Clark University – B.A. – Honors in Economics (Concentration: Econometrics and Regional/International Economics)
1991 – Rutgers University – M.B.A. – High Honors (Concentration: Corporate Finance)

PROFESSIONAL AFFILIATIONS:

American Finance Association
Financial Management Association
Society of Utility and Regulatory Financial Analysts
Member, Board of Directors – 2010-2012
President – 2006-2008 and 2008-2010
Secretary/Treasurer – 2004-2006
Energy Association of Pennsylvania
National Association of Water Companies – Member of the Finance/Accounting/Taxation Committee

SPEAKING ENGAGEMENTS:

"Regulatory Training in Financing Planning, Strategies and Accounting Issues for Publicly and Privately Owned Water and Wastewater Utilities", New Mexico State University Center for Public Utilities, October 14-19, 2012, Instructor (Cost of Financial Capital).

"Application of a New Risk Premium Model for Estimating the Cost of Common Equity", Co-Presenter with Dylan W. D'Ascendis, CRRA, AUS Consultants, Edison Electric Institute Cost of Capital Working Group, October 3, 2012, Webinar.

"Application of a New Risk Premium Model for Estimating the Cost of Common Equity", Co-Presenter with Dylan W. D'Ascendis, CRRA, AUS Consultants, Staff Subcommittee on Accounting and Finance of the National Association of Regulatory Commissioners, September 10, 2012, St. Paul, MN.

"Analyst Training in the Power and Gas Sectors", SNL Center for Financial Education, Downtown Conference Center at Pace University, New York City, August 7, 2012, Instructor (Financial Statement Analysis).

"Advanced Regulatory Training in Financing Planning, Strategies and Accounting Issues for Publicly and Privately Owned Water and Wastewater Utilities", New Mexico State University Center for Public Utilities, May 13-17, 2012, Instructor (Cost of Financial Capital).

"A New Approach for Estimating the Equity Risk Premium Applied to Public Utilities", before the Finance and Regulatory Committees of the National Association of Water Companies, March 29, 2012, Telephonic Conference.

"A New Approach for Estimating the Equity Risk Premium Applied to Public Utilities", (co-presenter with Frank J. Hanley, Principal and Director, AUS Consultants) before the Water Committee of the National Association of Regulatory Utility Commissioners' Winter Committee Meetings, February 7, 2012, Washington, DC.

"A New Approach for Estimating the Equity Risk Premium Applied to Public Utilities", (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University and Frank J. Hanley, Principal and Director, AUS Consultants) before the Wall Street Utility Group, December 19, 2011, New York City, NY.

"Advanced Cost and Finance Issues for Water", (co-presenter with Gary D. Shambaugh, Principal & Director, AUS Consultants), 2011 Advanced Regulatory Studies Program – Ratemaking, Accounting and Economics, September 29, 2011, Kellogg Center at Michigan State University – Institute for Public Utilities, East Lansing, MI.

"Public Utility Betas and the Cost of Capital", (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) – Advanced Workshop in Regulation and Competition, 30th Annual Eastern Conference of the Center for Research in Regulated Industries (CRRI), May 20, 2011, Rutgers University, Skytop, PA.

Moderator: Society of Utility and Regulatory Financial Analysts: 43rd Financial Forum – "Impact of Cost Recovery Mechanisms on the Perception of Public Utility Risk", April 14-15, 2011, Washington, DC.

"A New Approach for Estimating the Equity Risk Premium for Public Utilities", (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) – Hot Topic Hotline Webinar, December 3, 2010, Financial Research Institute of the University of Missouri.

"A New Approach for Estimating the Equity Risk Premium for Public Utilities", (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) before the Indiana Utility Regulatory Commission Cost of Capital Task Force, September 28, 2010, Indianapolis, IN

Tomorrow's Cost of Capital: Cost of Capital Issues 2010, Deloitte Center for Energy Solutions, 2010 Deloitte Energy Conference, "Changing the Great Game: Climate, Customers and Capital", June 7-8, 2010, Washington, DC.

"Cost of Capital Issues – 2010" – Deloitte Center for Energy Solutions 2010 Energy Conference: Changing the Great Game: Climate, Consumers and Capital, June 7-8, 2010, Washington, DC

"A New Approach for Estimating the Equity Risk Premium for Public Utilities", (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) – Advanced Workshop in Regulation and Competition, 29th Annual Eastern Conference of the Center for Research in Regulated Industries (CRRI), May 20, 2010, Rutgers University, Skytop, PA

Moderator: Society of Utility and Regulatory Financial Analysts: 42nd Financial Forum – "The Changing Economic and Capital Market Environment and the Utility Industry", April 29-30, 2010, Washington, DC

"A New Model for Estimating the Equity Risk Premium for Public Utilities" (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) – Spring 2010 Meeting of the Staff Subcommittee on Accounting and Finance of the National Association of Regulatory Utility Commissioners, March 17, 2010, Charleston, SC

"New Approach to Estimating the Cost of Common Equity Capital for Public Utilities" (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) - Advanced Workshop in Regulation and Competition, 28th Annual Eastern Conference of the Center for Research in Regulated Industries (CRRI), May 14, 2009, Rutgers University, Skytop, PA

Moderator: Society of Utility and Regulatory Financial Analysts: 41st Financial Forum – "Estimating the Cost of Capital in Today's Economic and Capital Market Environment", April 16-17, 2009, Washington, DC

"Water Utility Financing: Where Does All That Cash Come From?", AWWA Pre-Conference Workshop: Water Utility Ratemaking, March 25, 2008, Atlantic City, NJ

PAPERS:

"A New Approach for Estimating the Equity Risk Premium for Public Utilities", co-authored with Frank J. Hanley and Richard A. Michelfelder, Ph.D., Rutgers University, The Journal of Regulatory Economics (December 2011), 40:261-278.

"Comparable Earnings: New Life for an Old Precept" co-authored with Frank J. Hanley, Financial Quarterly Review, (American Gas Association), Summer 1994.